

Amendments to the Claims

1. (Currently Amended) A luminescent organometallic complex composition of matter, the composition comprising

at least one transition metal, M, that produces phosphorescent emission at room temperature;

at least one first monoanionic bidentate ligand coordinated through a nitrogen on a heteroaromatic ring and a carbon which is part of an aromatic group; and

at least one second ligand, ~~selected from a hydride and a ligand coordinated through a carbon atom on an aromatic group~~ and having Formula III

Ar[-(CH₂)_m-Y]_p

Formula III

wherein

Ar is an aromatic group,

Y is a group having a heteroatom capable of coordinating to metal M,

m is an integer from 1 through 20,

p is an integer from 1 through 5,

and further wherein one or more of the hydrogens in (CH₂)_m can be replaced with D or F.

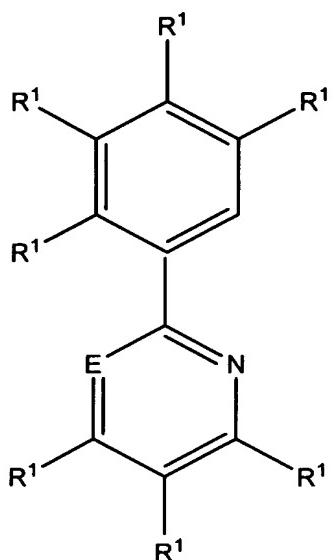
2. (Original) The composition of Claim 1, wherein M is selected from a metal listed in Groups 3-12 of the Periodic Table.

3. (Original) The composition of Claim 1, wherein M is selected from a metal listed in Groups 8-11 of the Periodic Table.

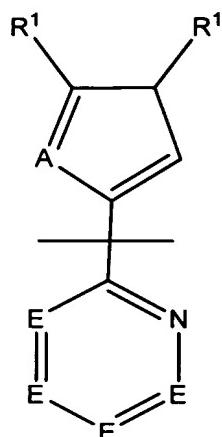
4. (Original) The composition of Claim 1, wherein M is selected from a group consisting of Ir, Rh, Ru, and Os.

5. (Original) The composition of Claim 1, wherein the first ligand is selected from an arylheterocycle and a heteroarylheterocycle.

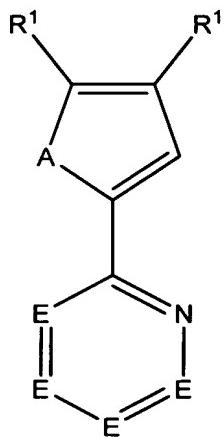
6. (Currently Amended) The composition of Claim 1, wherein the first ligand is selected from ligands having Formula I and ligands having ~~Formula II~~Formula II:



Formula I



—Formula II—



Formula II

wherein:

R¹ is the same or different at each occurrence and is selected from H, D, C_nH_{2n+1}, C_nH_{n-1}, OR², SR², N(R²)₂, F, C_n(H+F)_{2n+1}, OC_n(H+F)_{2n+1}, OC_nH_{n-1}, and OCF₂X, or adjacent pairs of R¹ can be joined to form a five- or six-membered ring;

R² is the same or different at each occurrence and is H, C_nH_{2n+1}, or C_n(H+F)_{2n+1}

A is S or NR²;

E is the same or different at each occurrence and is N or CR¹,

X is H, Cl, or Br, and

n is an integer from 1 through 20.

7. (Original) The composition of Claim 6, wherein the first ligand is selected from phenylpyridines, phenylpyrimidines, and phenylquinolines.

8. (Canceled).

9. (Currently Amended) The composition of Claim 81, wherein Y is selected from NR², OR², SR², and PR³, wherein

R² is the same or different at each occurrence and is H or C_nH_{2n+1}; and

R³ is the same or different at each occurrence and is selected from H, R², and Ar.

10. (Currently Amended) The composition of Claim 1, wherein the organometallic complex further comprises at least one additional ligand selected from a group consisting of amines, phosphines, alkoxides, halides, hydrides and orthometalated aryl groups.

11. (Original) The composition of Claim 1 having a luminescence emission maximum in the range of about 440 nm to 540 nm.

12. (Canceled).

13. (Canceled).

14. (Canceled).

15. (Currently Amended) The composition of Claim 1, wherein M is iridium, the first ligand is phenylpyridine with substituents, the second ligand is a phenyl ring, and further comprising two PPh₂ a,a'-diphenylphosphino-m-xylene.

16. (Canceled).

17. (Currently Amended) An electronic device including a light-emitting layer comprising at least one organometallic complex comprising:

a transition metal M that produces phosphorescent emission at room temperature;

a first monoanionic bidentate ligand coordinated through a nitrogen on a heteroaromatic ring and a carbon; and

a second ligand, selected from a hydride and a ligand coordinated through a carbon atom on an aromatic group and having Formula III

Ar-(CH₂)_m-Y_p

Formula III

wherein

Ar is an aromatic group,

Y is a group having a heteroatom capable of coordinating to metal M,

m is an integer from 1 through 20,

p is an integer from 1 through 5,

and further wherein one or more of the hydrogens in $(CH_2)_m$ can be replaced with D or F.

18. (Currently Amended) The device of Claim 17, wherein the organometallic complex further comprises at least one ligand selected from a group consisting of amines, phosphines, alkoxides, halides, hydrides and orthometalated aryl groups.

19. (Original) The device of Claim 17, wherein M is selected from a group consisting of a transition metal selected from Groups 3-12 of the Periodic Table.

20. (Original) The device of Claim 17, wherein M is selected from a metal listed in Groups 8-11 of the Periodic Table.

21. (Original) The device of Claim 17, wherein M is selected from a group consisting of Ir, Rh, Ru, and Os.

22. (Currently Amended) An electronic device comprising:

a photoactive layer for emitting light;

an electrode layer; and

a layer of charge transport material located between the photoactive layer and the electrode layer, wherein at least one of the photoactive layer, the electrode layer, and the layer of charge transport material includes an organometallic complex comprising:

a transition metal M that produces phosphorescent emission at room temperature;

at least one first monoanionic bidentate ligand coordinated through a nitrogen on a heteroaromatic ring and a carbon; and

at least one second ligand, selected from a hydride and a ligand coordinated through a carbon atom on an aromatic group and having Formula III

Ar₁-(CH₂)_m-Y]_p

Formula III

wherein

Ar is an aromatic group,

Y is a group having a heteroatom capable of coordinating to metal M,

m is an integer from 1 through 20,

p is an integer from 1 through 5,

and further wherein one or more of the hydrogens in $(CH_2)_m$ can be replaced with D or F.

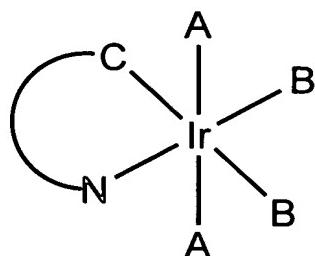
23. (Currently Amended) The device of Claim 22, wherein the organometallic complex further comprises at least one ligand selected from a group consisting of amines, phosphines, alkoxides, halides, hydrides and orthometalated aryl groups.

24. (Original) The device of Claim 22, wherein M is selected from a metal listed in Groups 3-12 of the Periodic Table.

25. (Original) The device of Claim 22, wherein M is selected from a metal listed in Groups 8-11 of the Periodic Table.

26. (Original) The device of Claim 22, wherein M is selected from a group consisting of Ir, Ru, Rh, and Os.

27. (Currently Amended) A phosphorescent organometallic composition capable of emitting blue light, the composition having a Formula IV:



Formula IV

wherein

C-N represents a monoanionic bidentate ligand coordinated through a nitrogen on a heteroaromatic ring and a carbon;

A represents a monoanionic ligand attachment,

B represents a nonionic ligand attachment,

wherein one or more of A's and B's may be joined together with each other, and at least one of A is a hydride or a carbon which is part of an aromatic group in a ligand having Formula III

Ar[-(CH₂)_m-Y]_p

Formula III

wherein

Ar is an aromatic group,

Y is a group having a heteroatom capable of coordinating to metal M,

m is an integer from 1 through 20,

p is an integer from 1 through 5,

and further wherein one or more of the hydrogens in (CH₂)_m can be replaced with D or F.

28. (Currently Amended) A method of generating blue light, the method comprising:

providing an organometallic complex comprising:

a transition metal M,

at least one first monoanionic bidentate ligand coordinated through a nitrogen on a heteroaromatic ring and a carbon,

at least one ligand, selected from a hydride and a ligand coordinated through a carbon atom on an aromatic group and having Formula III
Ar[-(CH₂)_m-Y]_p Formula III

wherein

Ar is an aromatic group,

Y is a group having a heteroatom capable of coordinating to metal M,

m is an integer from 1 through 20,

p is an integer from 1 through 5,

and further wherein one or more of the hydrogens in (CH₂)_m can be replaced with D or F; and

stimulating the organometallic complex to trigger phosphorescent emission.

29. (New) A luminescent organometallic complex composition of matter, the composition comprising

iridium;

at least one first ligand which is a phenylpyridine with substituents;

at least one second hydride ligand; and

two triarylphosphine ligands.

30. (New) A luminescent organometallic complex composition of matter, the composition comprising

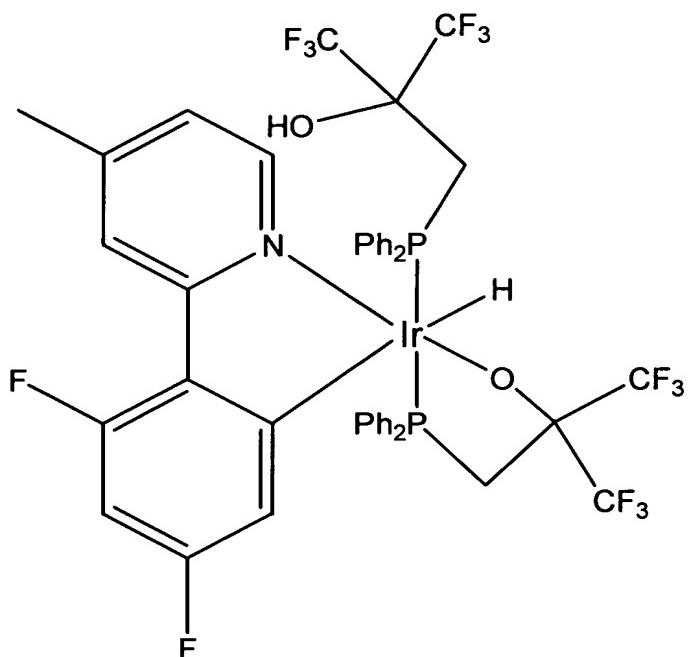
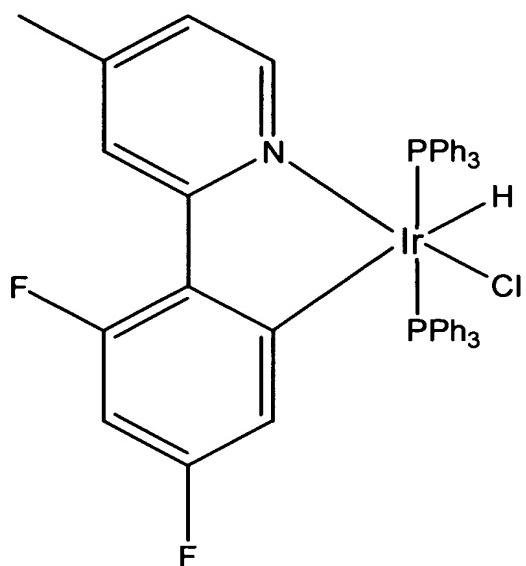
iridium;

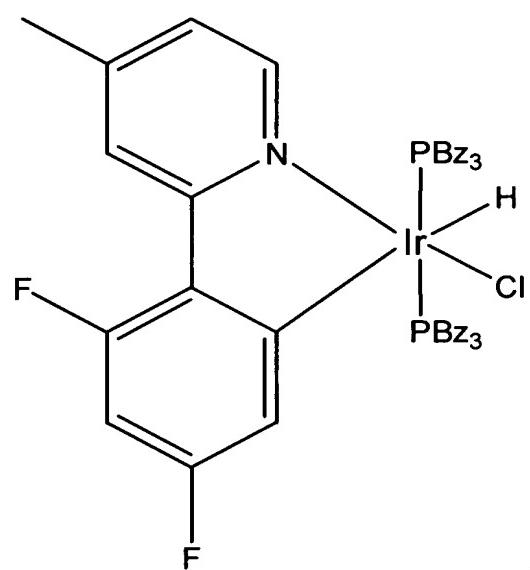
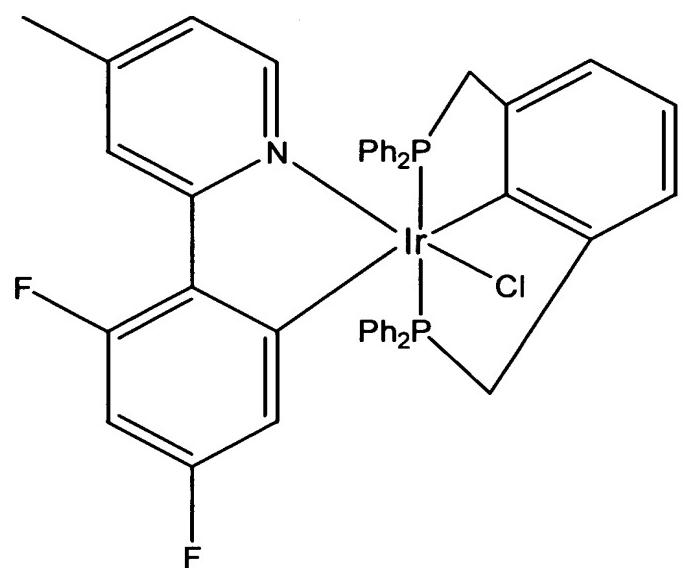
at least one first ligand which is a phenylpyridine with substituents;

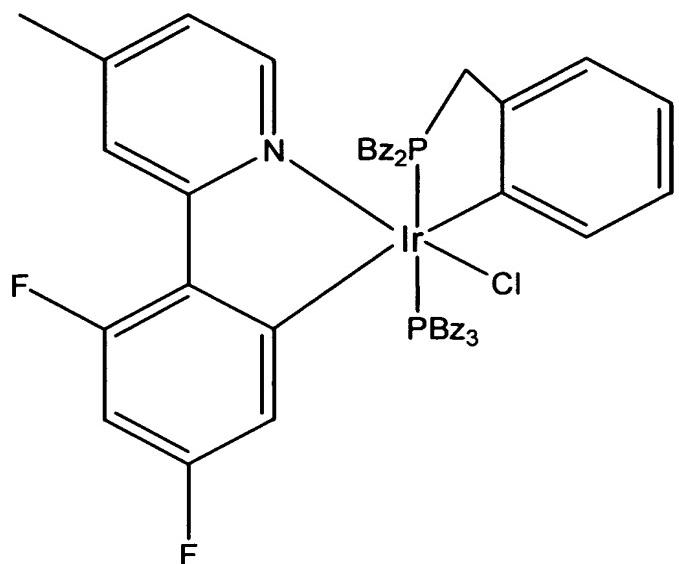
at least one second hydride ligand; and

two diarylbenzylphosphine ligands.

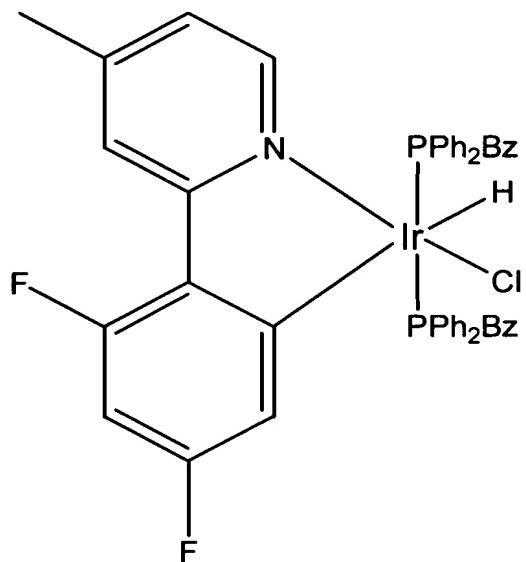
31. (New) A luminescent organometallic complex composition of matter selected from:







, or



where Ph is phenyl and Bz is benzyl.

32. The composition of Claim 1, wherein Ar is phenyl, m is 1, Y is $P(Ar)_2$, and p is 1 or 2.